# ~1989 Author Index~

BR, book review
TT, technical tip

Albertson, D.G. *In situ* hybridization using biotin-labeled probes (TT) 3
Allshire, R. see Hastie, N.D. 326
Ammermann, D. Sex and Death in Protozoa (BR) 419
Anderson, D.J. Cellular 'neoteny': a possible developmental basis for chromaffin cell plasticity 74
Arnheim, N. see White, T.J. 185
Arst, H.N. Jr, Kudla, B., Martinez-Rossi, N., Caddick, M.X., Sibley, S. and Davies, R.W. *Aspergillus* and mouse share a new class of 'zinc finger protein' (Letter) 291
Auffray, C. see Guillemot, F.G. 300
Barras, F. and Marinus, M.G. The Great GATC: DNA methylation in *E. coli* 139
Baulcombe, D. Anti-sense DNA and RNA (BR) 353
Baulcombe, D. Strategies for virus resistance in plants 55
Beckwith, J. Genetics of Bacterial Diversity (BR) 348
Beddington, R. Topobiology: an Introduction to Molecular Embryology (BR) 160
Beggs, A.H. see Kunkel, L.M. 232
Belcour, L. see Koll, F. 173
Belfort, M. Bacteriophage introns: parasites within parasites? 209
Bell, J. Chromosome crawling in the MHC 289
Benoist, C. see Fehling, H-J. 342
Bickmore, W.A. and Sumner, A.T. Mammalian chromosome banding – an expression of genome organization 144
Biggin, M.D. and Tjian, R. Transcription factors and the control of *Drosophila* development 337
Birky, C.W. Jr The Division and Segregation of Organelles (BR) 385
Blau, H. How fixed is the differentiated state? 268
Blow, J. Eukaryotic chromosome replication requires both α and δ polymerases 134
Blow, J. Mitosis comes apart 160
Blum, H.E., Gerok, W. and Vyas, G.N. The molecular biology of hepatitis B virus 154
Board, P.G. Ubiquitin (BR) 161
Böhni, P.C. see Deshaies, R.J. 87
Boocock, M.R. see Stark, W.M. 300
Born, W. The T-Cell Receptors (BR) 162
Bouck, N.P. Genetic Analysis of Tumor Suppression (BR) 384
Breeden, L. Molecular and Cell Biology of Yeasts (BR) 388
Brown, A.J.P. Yeast: A Practical Approach (BR) 159
Bulmer, M. Proceedings of the 2nd International Conference on Quantitative Genetics (BR) 128
Burmeister, M. and Lehrach, H. Isolation of large DNA fragments from agarose gels using agarase (TT) 41
Busby, S. An Introduction to Recombinant DNA Techniques; Basic Experiments in Gene Manipulation (BR) 127
Caddick, M.X. see Arst, H.N. Jr 291
Calame, K.L. Immunoglobulin gene transcription: molecular mechanisms 395
Capecchi, M. The new mouse genetics: altering the genome by gene targeting 70
Chandley, A.C. Aneuploidy Part B: Induction and Test Systems (Progress and Topics in Cytogenetics Vol. 7B) (BR) 128
Chater, K.F. Multilevel regulation of *Streptomyces* differentiation 372
Coleman, A.W. Cell staining with DAPI: alive? (Letter) 292
Coleman, D.V. see Ward, P. 97
Collins, F.S., O'Connell, P., Ponder, B.A.J. and Seizinger, B.R. Progress towards identifying the neurofibromatosis (NF1) gene 217
Cooke, J. The Heritage of Experimental Embryology: Hans Spemann and the Organiser (BR) 196
Cross, G.A.M. see Sherman, D.R. 137
Crystal, R.G. The $\alpha_1$-antitrypsin gene and its deficiency states 411
Dambly-Chaudière, C. see Ghysen, A. 251
Davey, J. Protein Transfer and Organelle Biogenesis (BR) 33
Davies, J.W. and Stanley, J. Geminivirus genes and vectors 77
Davies, K. Textbook of Human Genetics (BR) 317
Davies, K.A. and Lux, S. Hereditary disorders of the red cell membrane skeleton 222
Davies, R.W. see Arst, H.N. Jr 291
Davis, M.A. and Hynes, M.J. Regulatory genes in *Apergillus nidulans* 14
de Frutos, R., Kimura, K. and Peterson, K. *In situ* hybridization of *Drosophila* polytene chromosomes with digoxigen-dUTP-labeled probes (TT) 366
Deshaies, R.J., Kepes, F. and Böhni, P.C. Genetic dissection of the early stages of protein secretion in yeast 87
Devreotes, P. Cell–cell interactions in *Dictyostelium* development 242
Dickinson, H.G. Male Sterility in Higher Plants (Monographs on Theoretical and Applied Genetics, Vol. 10) (BR) 230
Dover, G. Four Billion Years: an Essay on the Evolution of Genes and Organisms (BR) 228
Dover, G. Slips, strings and species 100
Dover, G. The Eukaryotic Genome in Development and Evolution (BR) 30
Dressler, G.R. An update on the vertebrate homeobox 129
Drew, H.R. Nucleic Acids and Molecular Biology (Vol. 2) (BR) 32
Drews, G.N. and Goldberg, R. Genetic control of flower development 256
Dynan, W.S. Understanding the molecular mechanism by which methylation influences gene expression 35
Eichele, G. Retinoids and vertebrate limb pattern formation 246
Ellis, N. and Goodfellow, P.N. The mammalian pseudoautosomal region 406
Emery, A. The Foundations of Human Genetics (BR) 350
Erhardt, W. see Wittbrodt, J. 203
Erickson, R.P. Why isn't a mouse more like a man? 1
Erlich, H.A. see White, T.J. 85
Evans, D.A. Somaclonal variation – genetic basis and breeding applications 42

Evans, H.J. Working With Animal Chromosomes (2nd edn); Chromosome Structure and Function – Impact of New Concepts (BR) 163
Fantes, J. Cell staining with DAPI: or a bit of both? (Letter) 292
Fehling, H-J., Viville, S., van Ewijk, V., Benoist, C. and Mathis, D. Fine-tuning of MHC class II gene expression in defined microenvironments 342
Felsenstein, J. Computational Molecular Biology: Sources and Methods for Sequence Analysis; Biomolecular Data: a Resource in Transition (BR) 419
Finnegan, D.J. Eukaryotic transposable elements and genome evolution 103
Fiorucci, G. see Romeo, G. 19
Fischer Lindahl, K. Practical Isozyme Genetics (BR) 384
Foote, S.J. and Kemp, D.J. Chromosomes of malaria parasites 337
Frischauf, A-M. Mapping and Sequencing the Human Genome (BR) 34
Gally, J.A. Past imperfect (Letter) with reply by Maizels, N. 172
Gamborg, O.L. Applications of Plant Cell and Tissue Culture (BR) 352
Geliebter, J. see Sherman, D.R. 137
Georgopoulos, C. The *E. coli* dnaA initiation protein: a protein for all seasons 319
Gerhart, J. The primacy of cell interactions in development 233
Gerok, W. see Blum, H.E. 154
Ghysen, A. and Dambly-Chaudière, C. Genesis of the *Drosophila* peripheral nervous system 251
Goday, C. see Pimpinelli, S. 310
Goldberg, M.L. see Wu, C-t. 189
Goldberg, R. see Drews, G.N. 256
Goldfarb, P. Gene Structure and Transcription (BR) 386
Goodfellow, P. Happy Union Generates Order? 361
Goodfellow, P.N. Advances in Human Genetics (BR) 230
Goodfellow, P.N. see Ellis, N. 406
Goodfellow, P.N. The Genetic Jigsaw: A Story of the New Genetics (BR) 94
Gratecos, D. see Sémériva, M. 24
Gray, M.W. The evolutionary origin of organelles 294
Greenwald, I. Cell–cell interactions that specify certain cell fates in *C. elegans* development 237
Grivell, L.A. and Schweyen, R.J. RNA splicing in yeast mitochondria: Taking out the twists 39
Guillemot, F., Kaufman, J.F., Skjoedt, K. and Auffray, C. The major histocompatibility complex in the chicken 300
Gurdon, J.B. Developmental Biology: A Comprehensive Synthesis (Vol. 5) (BR) 95
Gurdon, J.B. Experiments in Animal Development (BR) 63
Gurdon, J.B., Mohun, T.J. and Taylor, M.V. Embryonic induction and muscle gene activation 51
Hastie, N. and Allshire, R. Human telomeres: fusion and interstitial sites 326
Hecht, F. Human Heredity, Principles and Issues (BR) 229
Heldin, C-H. and Westermark, B. Platelet-derived growth factor: three isoforms and two receptor types 108
Herrlich, P. and Ponta, H. 'Nuclear oncogenes' convert extracellular signals into changes in the genetic program 122
Hesketh, R. Genes and Gene Regulation (BR) 316
Hey, J. Principles of Population Genetics (2nd edn) (BR) 349
Hoffman, E.P. see Kunkel, L.M. 232
Holliday, R. Chromosome error propagation and cancer 42
Holliday, R. Untwisting B–Z DNA 355
Howe, C.J. Introduction to Practical Molecular Biology (BR) 94
Howe, C.J. Organelles (BR) 385
Hull, R and Will, H. Molecular biology of viral and nonviral retroelements 357
Hunt, T. Regulation of Enzyme Activity (BR) 127
Hynes, M.J. see Davis, M.A. 14
Jarman, A.P. and Wells, R.A. Hypervariable minisatellites: recombinators or innocent bystanders? 367
Jones, J. A phytophile responds... (Letter) 202
Jones, K. Heterochromatin – Molecular and Structural Aspects (BR) 62
Joyner, A. see Rossant, J. 277
Jurecić, R. see Volf, D. 292
Kaltschmidt, C. see Steiner, C. 138
Karin, M. Complexities of regulation by cAMP 65
Kaufman, J.F. see Guillemot, F. 300
Kemp, D.J. see Foote, S.J. 337
Kepes, F. see Deshaies, R.J. 87
Kimmel, C. Genetics and early development of zebrafish 283
Kimura, K. see de Frutos, R. 366
Klee, H.J. Plant Molecular Biology: A Practical Approach (BR) 351
Koenen, M. Recovery of DNA from agarose gels using liquid nitrogen (TT) 137
Koll, F. and Belcour, L. Are intron-encoded specific endonucleases responsible for nonhomologous recombination? (Letter) 173
Krejci, E. see Sémériva, M. 24
Kudla, B. see Arst, H.N. Jr 291
Kunkel, L.M., Hoffman, E.P. and Beggs, A.H. Duchenne Muscular Dystrophy (Oxford Monographs on Medical Genetics, Vol. 15) (BR) 232
Lagoda, P.J.L. see Mullenbach, R. 391
Laird, P.W. *Trans* splicing in trypanosomes – archaism or adaptation? 204
Lehrach, H. see Burmeister, M. 41
Lindgren, P. Ice nucleation as a 'reporter' of gene transcription activity (TT) 366
Little, P. Genetic Engineering (BR) 198
Lux, S.E. see Davies, K.E. 222
Maizels, N. Might gene conversion be the mechanism of somatic hypermutation in mammalian immunoglobulin genes? 4
Maizels, N. Reply to Gally letter 172
Malcolm, A.D.B. see Ward, P. 97
Manseau, L.J. and Schüpbach, T. The egg came first, of course! Anterior–posterior pattern formation in *Drosophila* embryogenesis and oogenesis 400
Marinus, M.G. see Barras, F. 139
Martinez Arias, A. Developmental Biology (2nd edn) (BR) 31
Martinez Arias, A. Molecular Biology of the Cell (BR) 420
Martinez Arias, A. A cellular basis for pattern formation in the insect epidermis 262

Martinez-Rossi, N. see Arst, H.N. Jr 291
Mathis, D. see Fehling, H-J. 342
Mohun, T.J. see Gurdon, J.B. 51
Moorefield, B. see Murphy, S. 122
Morrison-Graham, K. and Weston, J.A. Mouse mutants provide new insights into the role of intracellular matrix cell migration and differentiation 116
Mullenbach, R., Lagoda, P.J.L. and Welter, C. An efficient salt—chloroform extraction of DNA from blood and tissues (TT) 391
Murphy, S., Moorefield, B. and Pieler, T. Common mechanisms of promoter recognition by RNA polymerases II and III 122
Nadeau, J.H. Maps of linkage and synteny homologies between mouse and man 82
Nagley, P. Mitochondrial Biogenesis (BR) 61
Nagley, P. Trafficking in small mitochondrial RNA molecules 67
Naidet, C. see Sémériva, M. 24
Nakauchi, H. see Nakayama, K-i. 325
Nakayama, K-i. and Nakauchi, H. An improved method to make sequential deletion mutants for DNA sequencing (TT) 325
O'Connell, P. see Collins, F.S. 217
Pawson, T. Cellular Oncogene Activation (BR) 159
Pays, E. Pseudogenes, chimaeric genes and the timing of antigen variation in African trypanosomes 389
Peterson, K. see de Frutos, R. 366
Pieler, T. see Murphy, S. 122
Pimpinelli, S. and Goday, C. Unusual kinetochores and chromatin diminution in *Parascaris* 310
Piper, P. Genetic Engineering: An Introduction to Gene Analysis and Exploitation in Eukaryotes (BR) 29
Poethig, S. Genetic mosaics and cell lineage analysis in plants 273 (erratum 350)
Ponder, B.A.J. see Collins, F.S. 217
Ponta, H. see Herrlich, P. 112
Reik, W. Genomic imprinting and genetic disorders in man 331
Robinson, P. Antibodies: A Practical Approach (Vols 1 and 2) (BR) 354
Rogers, J. Cold Spring Harbor Symposium on Quantitative Biology (BR) 195
Rogers, J.H. How were introns inserted into nuclear genes? 213
Romeo, G., Fiorucci, G. and Rossi, G. Interferons in cell growth and development 19
Rossant, J. and Joyner, A. Towards a molecular-genetic analysis of mammalian development 277
Rossi, G. see Romeo, G. 19
Scazzocchio, C. Group I introns: do they only go home? 168
Schaffner, W. How do different transcription factors binding the same DNA sequences sort out their jobs? 37
Schinkel, A.H. and Tabak, H.F. Mitochondrial RNA polymerase: dual role in replication and transcription 149
Schüpbach, T. see Manseau, L.J. 400
Schweyen, R.J. see Grivell, L.A. 39
Scriver, C. The Prevention and Avoidance of Genetic Disease (BR) 96
Seizinger, B.R. see Collins, F.S. 217
Sémériva, M., Naidet, C., Krejci, E. and Gratecos, D. Towards the molecular biology of cell adhesion in *Drosophila* 24
Serfling, E. Autoregulation - a common property of eukaryotic transcription factors? 134
Sharpe, C.R. see Gurdon, J.B. 51
Sherman, D.R., Geliebter, J. and Cross, G.A.M. Rapid and simple amplification of a specific RNA sequence by the polymerase chain reaction (TT) 137
Sherratt, D. Bacterial and Bacteriophage Genetics: An Introduction (2nd edn) (BR) 231
Sherratt, D.J. see Stark, M. 304
Sibley, S. see Arst, H.N. Jr 291
Skjoedt, K. see Guillemot, F. 300
Slatkin, M. Evolutionary Genetics (BR) 349
Smith, A. Plant Molecular Biology, (2nd edn) (BR) 316
Smith, J. Positional signalling: where are we now? 165
Stanley, J. see Davies, J.W. 77
Stark, W.M., Boocock, M.R. and Sherratt, D.J. Site-specific recombination by Tn*3* resolvase 304
Steiner, C. and Kaltschmidt, C. An automated method for calcium phosphate-mediated gene transfer (TT) 138
Stewart, A. Huge Undertaking: Goal – Ourselves 361
Sumner, A.T. see Bickmore, W.A. 144
Symonds, N. Genetic Recombination (BR) 197
Tabak, H.F. see Schinkel, A.H. 149
Tjian, R. see Biggin, M.D. 377
van Ewijk, W. see Fehling, H-J. 342
Viville, S. see Fehling, H-J. 342
Volf, D. and Jurecić, R. Cell staining with DAPI: or dead? (Letter) 292
Vyas, G.N. see Blum, H.E. 154
Wallace, D.C. Mitochondrial DNA mutations and neuromuscular disease 9
Ward, P., Coleman, D.V. and Malcolm, A.D.B Regulatory mechanisms of the papillomaviruses 97
Wassom, D.L. Genetics of Resistance to Bacterial and Parasitic Infection (BR) 162
Wells, R.A. see Jarman, A.P. 367
Welter, C. see Mullenbach, R. 391
West, S.C. The Recombination of Genetic Material (BR) 29
Westermark, B. see Heldin, C-H. 108
Weston, J.A. see Morrison-Graham, K. 116
White, T.J., Arnheim, N. and Erlich, H.A. The polymerase chain reaction 185
Whittle, J.R.S. Mechanisms of Segmentation (BR) 418
Will, H. see Hull, R. 357
Winsor, B. A nod at differentiation: the *nod* gene product and initiation of *Rhizobium* nodulation 199
Witkowski, J. Is Science Necessary? (BR) 387
Wittbrodt, J. and Erhardt, W. An inexpensive and versatile computer-controlled PCR machine using a Peltier Element as a thermoelectric heat pump (TT) 202
Wu, C-t. and Goldberg, M.L. The *Drosophila zeste* gene and transvection 189

# ~1989 Subject Index~

Note that American spelling is used throughout the Index.
BR, Book Review
M, Monitor (this refers to the new Monitor section that began in the October issue)
TT, Technical Tip

*Abdominal-B* (*Abd-B*) gene, *Drosophila* 132, 379
*achaete-scute* gene complex, *Drosophila* 251
actin: expression in *Xenopus* development 53
adenovirus *trans*-acting factors 35, 66, 133
*Agrobacterium*, transformation by 57, 79
*Alu* repeats 146, 409
aminoacyl tRNA synthetase: role in yeast mitochondrial intron splicing 40
amphibia
  embryonic induction 233
  muscle formation 51
aneuploidy 128 (BR)
  in tumor cells 42
Angelman syndrome 332
ankyrin 222
Antennapedia complex, *Drosophila* 129, 132, 378
anterior–posterior pattern formation, *Drosophila* 165, 235, 400
antibiotic production, *Streptomyces* 372
antibodies 353 (BR)
antisense RNA 352 (BR)
  inhibition of plant viral infection 59
  prevention of Fos synthesis 114
$\alpha_1$-antitrypsin gene 411
AP-1, AP-2, AP-3, AP-4 transcription factors 65, 114, 132
*Arabidopsis*
  flower development 260
  mitotic crossing over 47
  telomeres 327
*Aspergillus nidulans*
  mitochondrial introns 168
  regulatory genes 14
  zinc finger gene 291
astrocyte differentiation: role of PDGF 110
ATF transcription factor 65
auxin-binding proteins 364 (M)

B cells
  immunoglobulin gene transcription 395
  MHC class II gene expression 343
  octamer transcription factor 37, 124, 130, 131
B complex, chicken 300
*Bacillus subtilis*: sigma factors 375
bacterial genetics (BR) 231, 348
bacteriophage
  introns 209
  T3 and T7 promoters 150
Beckwith–Wiedemann syndrome 332
*bicoid* (*bcd*) gene, *Drosophila* 129, 165, 266, 379, 400
biotin-labeled probes 3 (TT)
Bithorax complex
  *Drosophila* 189, 378
  leech homolog 394 (M)
*Borrelia burgdorferi* chromosome 365 (M)

*Caenorhabditis elegans*
  cell interactions in development 235, 237
  homeobox genes 393 (M)
  Tc1 transposable element 104
  *trans* splicing 206
  vulval development 237, 363 (M)
cancer and carcinogenesis *see* tumors and tumorigenesis
catenanes: and resolvase 306
*CDC*/*cdc* genes, yeast 134, 166, 365 (M), 394 (M)
*Cdx* gene, mouse 129
cell adhesion
  *Drosophila* 24, 394 (M)
  zebrafish neural development 285
cell cycle 166
  *CDC*/*cdc* genes, yeast 134, 365 (M)
  gene dosage 42
  *Xenopus* oocytes 394 (M)
cell interactions in development 233
  *Caenorhabditis elegans* 237
  *Dictyostelium* 242
  *Drosophila* PNS development 254
  insect cuticle 262
cell lineage
  mouse embryonic 277
  plant meristems 258, 272, 350
  sympathoadrenal 176
centromeres
  *Parascaris* 312
  *Saccharomyces cerevisiae* 322 (M)
chemotaxis, *Dictyostelium* 242
chicken
  immunoglobulin genes 5
  major histocompatibility complex 300
  neural development 285
chimeras, plant periclinal 274, 350
*Chlamydomonas*
  basal bodies/centrioles 393 (M)
  introns 169, 206
  TOC1 transposable element 358
chloroplast 385 (BR)
  genome evolution 294
  introns 168
  *trans* splicing 206
  transcription 153
chromaffin cell differentiation 174
chromatin diminution in *Parascaris* 310
chromosome 63 (BR), 163 (BR)
  banding 144
  *Borrelia burgdorferi* 365 (M)
  breakage and fragility 329
  nondisjunction 42
  rearrangements in somaclonal variation 47
  scaffold 324 (M)
ciliates
  chromatin diminution 311
  telomeres 326
cloning (BR) 29, 94, 127, 198
coat color mutants, mouse 118
collagen
  *Drosophila* 25
  mouse 119, 280
CpG
  islands 146, 290, 408
  methylated: binding protein 363 (M)
CRE(B) [cyclic AMP response element (binding protein)] 65
cuticle development, insect 262
cyanobacteria: and chloroplast evolution 296
cyclic AMP
  *Dictyostelium* development 242
  gene regulation 65
cyclins 134, 166
cystic fibrosis gene 360, 363 (M), 392 (M)
cytochrome *b* gene
  introns 168
  yeast 39, 392 (M)
cytochrome oxidase gene
  introns 168, 173
  yeast 39, 173
cytoplasmic male sterility 46, 230 (BR)

DAPI (4',6-diamidino-2-phenylindole) staining 292
*daughterless* gene, *Drosophila* 252
development (BR) 30, 31, 63, 95, 160, 196 *see also* embryogenesis
*Dictyostelium discoideum*
  cAMP signaling 235, 242
  cell interactions in development 242
  DIF (differentiation-inducing factor) 165, 242
  DIRS-1 transposable element 104
DNA
  amplification 105, 179, 185
  B and Z 355
  bending and scaffold attachment 324 (M)
  extraction from blood and

    tissues 391 (TT)
  isolation of fragments from agarose gels (TT) 41, 137
  methylation 35, 44, 139
  repair 139
  replication 100, 134, 141, 145, 152, 319, 326, 369
  sequencing 18, 325 (TT)
  slippage 100
dnaA protein, *E. coli* 319
DNA polymerases 134, 185, 319
*Dominant spotting* mutant, mouse 119
Down syndrome locus 365 (M)
  mouse homolog 85
*Drosophila*
  anterior–posterior pattern formation 165, 235, 400
  Bithorax complex 189, 378
  cell adhesion 24, 394 (M)
  homeobox genes 129, 131, 381
  interspecies gene differences 100
  mitosis in early embryos 322 (M)
  oogenesis 403
  *Notch* gene 364 (M)
  *period* (*per*) genes 100
  peripheral nervous system development 251, 324 (M)
  segmentation 265, 378, 400, 418 (BR)
  transcription factors 377
  transposable elements 103, 357
  transvection 189
Duchenne muscular dystrophy 2, 232 (BR)

E1A protein, adenovirus 66, 133
EGF (epidermal growth factor) 241
elliptocytosis, hereditary 223
embryogenesis
  anterior–posterior pattern formation in *Drosophila* 165, 235, 400
  applications of PCR 188
  cell interactions 233, 237, 242, 263
  gradient models 234, 246, 262, 402
  homeobox genes 129, 131, 278, 286, 381
  induction 51, 165, 233, 278
  limb development 246
  *Parascaris* 310
  positional signaling 165, 262
  role of extracellular matrix 24, 116
  role of interferons 23
  segmentation 265, 378, 400, 418 (BR)
  zebrafish development 283
embryonal stem (ES) cells 72, 279
endosymbiont hypothesis for organelle origin 294
*engrailed* (*en*) gene
  *Drosophila* 265, 378, 392 (M)
  mouse 278
enhancers *see* promoters/enhancers
enzyme activity 127 (BR)
epidermal growth factor (EGF) 241
erythrocyte membrane skeleton 222
ES (embryonal stem) cells 72, 279
*Escherichia coli*
  cell division 364 (M)
  DNA methylation 139
  initiation of replication 319
  RNA–DNA complexes 358
*even-skipped* (*eve*) gene, *Drosophila* 129, 132, 378
evolution (BR) 30, 228, 349
  applications of PCR 186
  bacterial sigma factors 376
  of catalysis 195 (BR)
  chemical 394 (M)
  minisatellite 368
  organelle genomes 294
  position of introns 214
  of retroelements 359
  role of transposable elements 103
  slippage 100
  X and Y chromosomes 409
exon shuffling 323 (M)
extracellular matrix
  *Drosophila* 24
  mouse mutants 116

fasciclin, *Drosophila* 26, 394 (M)
fibroblast growth factor (FGF) and mesoderm induction 53, 165, 278
fibronectin, *Drosophila* 25
flower development 256
forensic analysis, applications of PCR 188
*fos* oncogene/Fos protein 20, 66, 112, 132
fragile sites in chromosomes 329
*fushi tarazu* (*ftz*) gene, *Drosophila* 129, 131, 266, 378

G proteins in *Dictyostelium* 243
gap genes, *Drosophila* 165, 264, 378
gastrulation
  amphibia 233, 284
  zebrafish 284
geminivirus 77
gene conversion
  immunoglobulin genes 4, 172
  trypanosome VSG genes 390
gene mapping
  chicken B complex 301
  human genome 360
  major histocompatibility complex 289
  mouse genome 82
  neurofibromatosis 218
  pseudoautosomal region 408
gene targeting 70, 281
gene transfer, calcium phosphate-mediated 138 (TT)
genetic disease (BR) 96, 230, 232
  $\alpha_1$-antitrypsin deficiency 411
  applications of PCR 186
  Down syndrome 365 (M)
  and genomic imprinting 331
  hemolytic anemias 223
  mitochondrial DNA mutations 9
  mouse homologs of disease genes 85
  mouse models 1
  neurofibromatosis 217
genetic engineering (BR) 29, 198
genetics textbooks (BR) 229, 231, 316, 317, 349
germinal centers: MHC class II gene expression 344
GF-1 protein of erythroid cells 291
GHF-1 transcription factor 130, 132
Giemsa staining of chromosomes 144
*glp-1* gene, *C. elegans* 240
glycosylation of proteins, yeast 90
gonad development, *C. elegans* 237
growth factors
  EGF 241
  FGF 53, 165, 278
  NGF 174
  PDGF 108

heat shock proteins
  mitochondrial 324 (M)
  protein translocation in yeast 88
helicase
  *E. coli* dnaB protein 319
  and splicing in yeast mitochondria 39
helix–turn–helix motif 38, 129
hemolytic anemia 223
hepadnaviruses 154
hepatitis B virus 154
hepatocellular carcinoma 154
heterochromatin 62 (BR)
  elimination 310
heterokaryons 268
histone genes
  H1 kinase 166
  promoters 37
homeobox genes
  *C. elegans* 393 (M)
  chicken 249
  *Drosophila* 129, 131, 381
  mammalian 37
  mouse (*Hox* genes) 75, 129, 249, 278, 286, 365 (M)
  *Xenopus* 130, 392 (M)
  zebrafish 286
homeotic mutants, *Arabidopsis* 260
homologous recombination 70, 281, 355

housekeeping genes
  location in chromosome bands 146
  promoters 37
*HPRT/hprt* (hypoxanthine guanine phosphoribosyl transferase) gene
  Lesch–Nyhan syndrome 1, 85
  targeted disruption 72, 281
human genetics (BR) 34, 94, 128, 229, 230, 232, 317, 350
Human Genome Organization (HUGO) 360
human genome project 34 (BR), 361
*hunchback* (*hb*) gene, *Drosophila* 100, 165, 382, 400
Huntington's disease locus
  imprinting 333
  mouse homolog 85
hybrid dysgenesis 105
hydatidiform moles 332
hypervariable minisatellites 367

immunoglobulin genes
  octamer factor 37, 124, 130, 131
  somatic hypermutation: role of gene conversion 4, 172
  transcription 395
imprinting: and genetic disease 331
infantile bilateral striatal necrosis 10
*in situ* hybridization (TT) 3, 366
*int* genes 278, 286, 394 (M)
integrin, *Drosophila* 26
interferons 19
intron
  bacteriophage 209
  group I 168, 209, 215
  group II 215
  insertion 213
  mitochondrial 39
isochores 145
isozyme genetics 384 (BR)

*jun* oncogene/Jun protein 66, 113, 132

Kearns–Sayre syndrome 12
kinetochores 313
*kit* (c-*kit*) proto-oncogene 279

laminin, *Drosophila* 24
leaf development 275, 350
Leber's hereditary optic neuropathy 9
Lesch–Nyhan syndrome 1, 85
*Lethal spotting* mutant, mouse 119
leucine zipper 66, 133, 398
limb development 235, 246
*lin-12* gene, *C. elegans* 238
LINE elements 104, 146, 357
linkage analysis
  hemolytic anemias 223
  mouse 82
  neurofibromatosis 217
maize (*Zea mays*)
  auxin-binding proteins 364 (M)
  shoot development 275
  transposons 47, 104
major histocompatibility complex (MHC)
  chicken 300
  gene expression in defined microenvironments 342
  number of expressed genes 289
malaria parasite chromosomes 170, 337
maternal effect genes, *Drosophila* 165, 265, 378, 400
maturase, mitochondrial 39
maturation promoting factor (MPF) 166, 394 (M)
meristem, plant 256, 273
mesoderm induction 51, 165
messenger RNA (mRNA)
  splicing in bacteriophage 209
  splicing in yeast mitochondria 39
  *trans* splicing 204
metabolic pathway regulation, *Aspergillus* 14
methylation
  in *E. coli* 139
  and gene expression 35, 44
minisatellites, hypervariable 367
mitochondria 385 (BR)
  biogenesis 61 (BR)
  cytoplasmic male sterility in plants 46
  DNA replication 152
  genome evolution 294
  heat shock proteins 324 (M)
  introns 39, 168
  mutations and neuromuscular disease 9
  RNA polymerase 149
  small RNAs 67
mitosis
  and chromatin diminution in *Parascaris* 310
  chromosome nondisjunction 42
  control 166
  crossing over 47
  early *Drosophila* embryos 322 (M)
  metaphase–anaphase transition 364 (M)
molecular biology (BR) 29, 32, 94, 127, 198, 316, 351, 420
mosaics, plant genetic 272
mouse
  embryogenesis 277
  extracellular matrix mutants 116
  gene targeting 70, 281
  genomic imprinting 331
  homeobox (*Hox*) genes 75, 129, 249, 278, 286, 365 (M)
  homologs of human disease genes 85, 226
  interferons 20
  *iv* gene 324 (M)
  MHC class II gene expression 342
  models for human genetic disease 1
  *sex-reversed* (*sxr*) mutation 406
  synteny with human 82, 335
  t haplotype 393 (M)
MPF (maturation-promoting factor) 166, 394 (M)
multidrug resistance (*mdr*) gene, *Plasmodium* 341
muscle
  development in amphibia 51, 363 (M)
  development in zebrafish 287
  gene expression in heterokaryons 268
mutagens and mutagenesis
  hotspots in *E. coli* 143
  mouse development 279
  targeted 70, 281
  zebrafish development 286
*myb* oncogene 323 (M)
*myc* oncogenes/Myc proteins 20, 113
myoclonic epilepsy and ragged red muscle fiber disease 11
myogenic factors (MyoD, myf-5, myogenin) 55, 272, 363 (M)
myxobacteria: RNA–DNA complexes 358

NADH dehydrogenase: mutations 10
*nanos* gene, *Drosophila* 165, 400
nerve growth factor (NGF) 174
neural cell adhesion molecule (N-CAM)
  *Drosophila* 26
  mammalian muscle 270
neural crest 116, 130, 174
neural development
  *Drosophila* peripheral nervous system 251, 324 (M)
  mouse 278
  neuron differentiation 174
  *Xenopus* 324 (M)
  zebrafish 285
neurofibromatosis 217, 333
*Neurospora crassa*
  mitochondrial introns 168, 210
  mitochondrial plasmids 358
neutrophil elastase 411
NF-κB factor 396
*Nicotiana see* tobacco
nitrogen fixation 199
*nod* genes, *Rhizobium* 199
*Notch* gene, *Drosophila* 364 (M)

octamer factor 37, 124, 130, 131, 396
oligodendrocyte differentiation: role of PDGF 110
oligosaccharide synthesis, yeast 91

oncogenes 159 (BR) *see also* proto-oncogenes
  nuclear 112
  *sis* (PDGF) 109, 112
oogenesis, *Drosophila* 403
organelles 385 (BR)
  evolution 294
  introns 39, 168
origin of replication, *E. coli* 141
oxidative phosphorylation genes
  genetic defects 9
  introns 39, 168

*paired* (*prd*) gene, *Drosophila* 129, 131, 379
papillomaviruses 97
*Parascaris equorum* chromatin diminution 310
*Patch* mutant, mouse 120
pattern formation
  *Drosophila* 165, 254, 262, 400
  vertebrate limb development 246
PCNA (proliferating cell nuclear antigen) 134
PCR *see* polymerase chain reaction
PDGF (platelet-derived growth factor) 108
*period* (*per*) genes, *Drosophila* 100
peripheral nervous system development 251, 324 (M)
philosophy of science (BR) 387
*Physarum polycephalum* introns 168, 211
*Piebald* mutant, mouse 119
Pit-1 transcription factor 130, 132
plant breeding: somaclonal variation 49
plant molecular biology (BR) 230, 316, 351
plant tissue culture 352 (BR)
plant virus resistance 56
*Plasmodium falciparum* chromosomal polymorphisms 170, 337
platelet-derived growth factor (PDGF) 20, 108
*Podospora anserina* mitochondrial introns 170, 173, 215
polar coordinate model for pattern formation 234, 246
polymerase chain reaction (PCR) 179 (centerfold), 185
  in human genome project 361
  identification of specific mRNAs 279
  machine 202 (TT)
  RNA amplification 137 (TT)
  with silver staining for detection of DNA fragments 293 (TT)
  targeted mutagenesis 282
polyploidy
  and chromatin diminution 312
  in somaclonal variation 46
population genetics (BR) 128, 349
posterior group genes, *Drosophila* 165, 400
POU box 37, 396
primase, *E. coli* 319
proliferating cell nuclear antigen (PCNA) 134
promoters/enhancers
  *Aspergillus* structural genes 16
  cyclic AMP responsive 65
  *Drosophila* developmental genes 378
  immunoglobulin genes 395
  methylation 35
  mitochondrial 150
  octamer factor-binding 37
  polymerase II and polymerase III 122
protein kinase
  cell cycle (M) 365, 394
  PDGF receptor 109
protein phosphatase 323 (M)
protein transport 34 (BR)
  secretion in yeast 87
proto-oncogenes
  inhibition by interferons 20
  *int-1* 278, 286, 394 (M)
  c-*jun* 66
  c-*kit* 279
protozoa 311, 326, 419 (BR)
pseudoautosomal region of mammalian sex chromosomes 406
pseudogenes: and antigenic variation in trypanosomes 389

quantitative genetics 128 (BR)

radiation hybrid mapping 361
*ras* oncogene/Ras protein 20, 112, 393 (M)
recombination 197 (BR)
  applications of PCR 187
  generation of size polymorphisms in *Plasmodium* chromosomes 339
  homologous 70, 281, 355
  internal telomere-like sequences 330
  nonhomologous: involvement of intron-encoded endonucleases 173
  site-specific: and resolvase in bacteria 304
  trypanosome VSG genes 390
replication, DNA
  and chromosome banding 145
  DNA polymerases 134
  geminivirus 78
  hepatitis B virus 156
  hotspots and minisatellites 369
  initiation in *E. coli* 141, 319
  mitochondrial DNA 152
  slippage 100
  telomeres 326
reporter gene, ice nucleation 366 (TT)
resistance to infection 162 (BR)
resolvase 304
retinoblastoma (*RB1*) gene
  imprinting 335
  mouse homolog 84
retinoic acid 246
retroelements 357
retroviruses 357
reverse transcriptase 357
*Rhizobium nod* genes 199
ribosomal RNA (rRNA)
  sequence comparisons, organelle 294
  *Xenopus* 122
RNA *see also* messenger RNA; ribosomal RNA; transfer RNA
  amplification by PCR 137 (TT), 186
  catalysis 195 (BR), 207, 323 (M)
  mitochondrial 40, 67
RNA polymerase
  bacteriophage T7 150
  mitochondrial 149
  polymerases II and III 122
root development 276

*Saccharomyces cerevisiae* (budding yeast) (BR) 159, 388
  *CDC* genes 134
  centromeres 322 (M)
  mitochondrial import of RNA 67
  mitochondrial introns 39, 168, 173, 210
  mitochondrial RNA polymerase 149
  protein secretion 87
  *RAS* genes 393 (M)
  transcription termination 322 (M)
  Ty element 103
satellite RNA
  hypervariable minisatellites 367
  plant viruses 57
*Schizosaccharomyces pombe* (fission yeast) 388 (BR)
  *cdc* genes 166, 365 (M), 394 (M)
secretion of proteins in yeast 87
segmentation
  *Drosophila* 378, 418 (BR)
  mouse 278
  zebrafish 285
segment polarity genes, *Drosophila* 265, 378
sequence analysis 419 (BR)
sequence tagged sites (STSs) 361
sex determination 406
  application of PCR 187
shoot development 273
SIF (small intensely fluorescent) cell differentiation 174
sigma factors, bacterial 375
signal peptide, yeast 89
SINE elements 106, 146, 357
*sis* oncogene 109, 112

slippage in DNA 100
small nuclear RNAs (snRNAs) 124, 205
somaclonal variation 46
somatic cell hybrids 218, 268
somatic hypermutation of immunoglobulin genes 4
Sp1 transcription factor 35
spectrin 22
spherocytosis, hereditary 223
splicing
  bacteriophage 209
  mitochondria 39, 169
  *trans* 204
sporulation, *Streptomyces* 372
*src* oncogene 20, 112
*Steel* (*Sl*) mutants, mouse 118
steroid sulfatase (*STS*/*Sts*) gene 322 (M), 407
*Streptomyces* differentiation 372
supercoiling: and bacterial site-specific recombination 305
SV40 (simian virus 40) Sp1 transcription factor 35
synteny: mouse/human 82, 335

T cell receptors 162 (BR)
t haplotype mouse: sperm differentiation 393 (M)
TATA box 37, 123, 393 (M)
telomeres 326
  malaria parasite 338
terminal group genes, *Drosophila* 401
testis-determining factor (TDF) 406
*Tetrahymena* introns 168, 207
TFIIB, D, E transcription factors 122, 393 (M)
TFIIIA, B, C transcription factors 122
TGF-β *see* transforming growth factor-β
thymus: MHC class II gene expression 345
tissue culture: somaclonal variation 46
Tn*3* transposon 304
tobacco (*Nicotiana*)
  geminivirus infection 78
  leaf development 275
  somaclonal variation 46
  Tn*t1* retrotransposon 358
  virus resistance 57
tobacco mosaic virus (TMV) 57, 323 (M)
tomato (*Lycopersicon*)
  somaclonal variation 47
  virus resistance 57
*torso* gene, *Drosophila* 401
TPA-responsive element (TRE) 65
transcription 386 (BR)
  autoregulation 131
  control in *Drosophila* 377
  control by methylation 35
  immunoglobulin genes 395
  initiation in mitochondria 150
  by RNA polymerases II and III 122
  termination 320, 322 (M)
  and transvection 191
transcription factors and *trans*-acting factors
  AP-1, AP-2, AP-3, AP-4 65, 114, 132
  ATF 65
  C/EBP 398
  CREBP 65
  E1A, adenovirus 66, 133
  ENKTF-1 65
  GF-1 291
  GHF-1 130, 132
  Jun 66
  MLTF, adenovirus 35
  NF-κB 396
  NodD protein, *Rhizobium* 199
  octamer factors 37, 124, 130, 131, 396
  Pit-1 130, 132
  Sp1 35
  TFIIB, D, E 122
  TFIIIA, B, C 122
  zeste protein 191
transdifferentiation 174, 268
transfer RNA (tRNA)
  import into mitochondria 67
  for selenocysteine 323 (M)
  *Streptomyces bldA* gene 373
transformation
  interferon effects 19
  mediated by platelet-derived growth factor (PDGF) 110
  nuclear oncogenes 112
transforming growth factor-β (TGF-β): mesoderm induction 53, 278
transgenic mice
  embryo transfer 293 (TT)
  MHC class II gene expression 342
  for studies on early development 279
transgenic plants
  geminivirus-based vectors 80
  virus resistance 57
translocations
  somaclonal variation 47
  and Z DNA 356
transposable elements
  bacterial 140, 304
  *Drosophila* 103, 357
  and evolution 103
  plant 47, 202
  retroelements 357
transvection 189
trypanosomes
  antigenic variation 389
  *trans* splicing 204
tumor suppressor genes 44, 220, 384 (BR)
tumors and tumorigenesis
  association with papillomaviruses 97
  chromosome nondisjunction 42
  genomic imprinting 334
  hepatocellular carcinoma 154
  interferon effects 19
  nuclear oncogenes 112
  platelet-derived growth factor (PDGF) 110
  and telomeric fusions 327

U1, U2, U6 small nuclear RNAs 123
ubiquitin 161 (BR)
*Ultrabithorax* (*Ubx*) gene, *Drosophila* 132, 378

variant surface glycoproteins, trypanosome 389
viral infection
  hepatitis B 154
  interferon effects 19
  Marek's disease in chickens 303
  papillomaviruses 97
  plant geminiviruses 77
  resistance in plants 56
VNTR (variable number tandem repeat) 367
vulval development, *C. elegans* 239, 363 (M)

*white* gene, *Drosophila* 189, 379
Wilms' tumor 334
*wingless* gene, *Drosophila* 265, 278

X chromosome
  gene order 86
  inactivation (M) 322, 364, 407
  pseudoautosomal region 406
*Xenopus*
  gastrulation 284
  *int-1* gene 394 (M)
  maturation-promoting factor (MPF) 394 (M)
  mesoderm induction 165, 363 (M)
  mitochondrial RNA polymerase 149
  muscle formation 51
  *MyoD* gene 363 (M)
  neural induction 324 (M)
  rRNA gene transcription 123
  *XlHbox1* homeobox gene 130, 250, 392 (M)

Y chromosome: pseudoautosomal region 406
yeast *see Saccharomyces cerevisiae* and *Schizosaccharomyces pombe*

Z DNA 355
*Zea mays see* maize
zebrafish development 283
*zen* (*zerknullt*) gene, *Drosophila* 131, 379
*zeste* gene, *Drosophila* 189, 378
zone of polarizing activity 246